

T03D05 – Periodicity SL Material Practice

Name.....

1. Which **two** elements react most vigorously with each other?
- chlorine and lithium
 - chlorine and potassium
 - iodine and lithium
 - iodine and potassium
2. Which of the following statements are correct?
- The melting points decrease from Li to Cs for the alkali metals.
 - The melting points increase from F to I for the halogens.
 - The melting points decrease from Na to Ar for the period 3 elements.
- I and II only
 - I and III only
 - II and III only
 - I, II and III
3. The compounds Na_2O , Al_2O_3 and SO_2 respectively are
- acidic, amphoteric and basic.
 - amphoteric, basic and acidic.
 - basic, acidic and amphoteric.
 - basic, amphoteric and acidic.
4. Which compound of an element in period 3 reacts with water to form a solution with a pH greater than 7?
- SiO_2
 - SiCl_4
 - NaCl
 - Na_2O
5. Which of the following properties of the halogens increase from F to I?
- Atomic radius
 - Melting point
 - Electronegativity
- I only
 - I and II only
 - I and III only
 - I, II and III
6. Which pair of elements reacts most readily?
- $\text{Li} + \text{Br}_2$
 - $\text{Li} + \text{Cl}_2$
 - $\text{K} + \text{Br}_2$
 - $\text{K} + \text{Cl}_2$
7. State and explain the trends in the atomic radius and the ionization energy
- (i) for the alkali metals Li to Cs.

(4)

(ii) for the period 3 elements Na to Cl.

(4)

(Total 8 marks)

8. Describe the acid-base character of the oxides of the period 3 elements Na to Ar. For sodium oxide and sulfur trioxide, write balanced equations to illustrate their acid-base character.

(Total 3 marks)

9. With reference to the types of bonding present in period 3 elements:

(i) explain why Mg has a higher melting point than Na.

(2)

(ii) explain why Si has a very high melting point.

(2)

(iii) explain why the other non-metal elements of period 3 have low melting points.

(2)

(Total 6 marks)

10. Explain why sulfur has a lower first ionization energy than oxygen, and also a lower first ionization energy than phosphorus.

(Total 4 marks)

11. (i) Define the term *ionization energy*.

(1)

(ii) Write an equation for the reaction of lithium with water.

(1)

(iii) State and explain the trend in the ionization energy of alkali metals down the group.

(3)

(iv) Explain why the electronegativity of phosphorus is greater than that of aluminum.

(2)

(v) Table 8 in the Data Booklet contains two values for the ionic radius of silicon. Explain, by reference to atomic structure and electron arrangements, why the two values are very different.

(4)

(Total 11 marks)